

Kelsey E. Fisher

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EDUCATION

Iowa State University Ph.D. in Entomology; Graduate Certificate of Geographic Information Systems <i>Graduate Research Excellence Award</i> GPA: 3.87 Adviser: Dr. Steven P. Bradbury	Ames, IA May 2021
University of Delaware Master of Science in Entomology GPA: 3.72 Adviser: Dr. Charles E. Mason	Newark, DE Dec 2015
Widener University Bachelor of Science in Biology GPA: 3.32 Advisers: Dr. Katherine Goodrich & Dr. Janice Krumm	Chester, PA May 2013

PROFESSIONAL ASPIRATIONS

My professional goal is to serve as a research scientist within diverse, interdisciplinary teams, planning and conducting cutting-edge research at a landscape scale that directly supports and improves the sustainability of pollination services, native species conservation, and natural resource management. In addition to my research contributions, I envision actively and effectively communicating research plans and findings within the scientific community, with decision-makers, and with stakeholders to help implement science-informed recommendations.

RESEARCH FOCUS

Discerning animal movement, dispersal, and space use in fragmented landscapes is foundational to understanding population dynamics, population persistence, and population distribution. I aim to employ multiple, cutting-edge techniques (i.e., radio telemetry, GIS, population genetic, stable isotope, and radar aeroecology analyses) to inform modeling efforts and understand movement at various spatial scales to develop robust conservation and land management strategies. I augment my research efforts with knowledge of insect-plant interactions, chemical ecology, and insect behavior.

WORK EXPERIENCE

Postdoctoral Research Associate Iowa State University, Ames, IA	3/2021-present
Ph.D. Graduate Research Assistant Iowa State University, Ames, IA	1/2016-2/2021
Interdisciplinary Writing Consultant Iowa State University, Ames, IA	1/2020-5/2021
M.S. Graduate Research Assistant University of Delaware, Newark, DE	6/2013-12/2015
Undergraduate Research Assistant Widener University, Chester, PA	5/2010-5/2013

RESEARCH EXPERIENCE

Postdoctoral Research Associate, Iowa State University

2021-present

Main Project: *“Quantifying spatial-temporal trends in continental-scale insect dispersal based on genetic and stable isotope variation”*

Employing methods to analyze insect movement ecology and dispersal at a continental scale. Specifically, it is unknown if the effects of the monarch butterfly population decline and associated potential loss of genetic diversity reduce the ability of monarchs to adapt to a changing climate. This project analyzes variation within full mitochondrial DNA genome sequences across breeding, overwintering, and non-migratory locations. Data are interpreted with corresponding analyses of stable isotopic signatures of d2H and d18O to verify natal origins and intensively identify individual migratory paths. Combining genetic variation with stable isotope-based estimates provides an ideal means to estimate population variability, gene flow, and effective population size, which in turn will provide insights on the resiliency of the North American monarch butterfly migration.

Postdoctoral Seed Grant: *“Locating bumblebee (*Bombus* spp.) nest sites with VHF radio telemetry”*

Bumblebees (*Bombus* sp.) are native, generalist pollinators that are highly linked in the pollination network, attributing to pollination of wild plants and enhancing crop yield. Bumblebee species in the US are in decline in association with land conversion for agriculture, which has reduced the abundance of potential nesting sites. Because finding existing bumblebee nests in the field is difficult and nests are rarely visually located, nest-site preferences are often estimated with indirect methods including monitoring artificial nests and observing nest-searching behavior by bumblebee queens. Detection of nesting sites may be improved with radio telemetry. Here, I am testing methods to use very high frequency (VHF) radio telemetry with bumblebees with the goal of locating wild bumblebee nests.

Additional Responsibilities:

- Expert scientist representative with the Iowa Monarch Conservation Consortium and Iowa State University Monarch Working Group
- Train professional staff and students vegetation and butterfly survey methods and data management strategies with GitHub and R/RStudio
- Serve on a taskforce focused on navigating the social and scientific complexities associated with managing pest resistance and the implementation of the Iowa Pest Resistance Management Plan
- Professional Development and Training (see sections for additional descriptions) –
 - Research: 5-day Radar Aeroecology Workshop; Using Rules of Life to Address Societal Challenges Workshop & Incubator Series
 - Teaching: Guest instructor for “Stable Isotopes in the Environment”; An Introduction to Evidence-based Undergraduate STEM Teaching; Ethical Dilemmas in the College Classroom: A Case Studies Workshop
 - Service: Research Farm Field Days with Dr. Erin Hodgson
 - Other: The Postdoc Academy: Building Skills for a Successful Career; Professional Advancement Career Training (PACT); Start Smart Salary Negotiation Workshop

Graduate Research Assistant, Iowa State University

2016-2021

Ph.D. Dissertation: *“Investigating monarch butterfly (*Danaus plexippus*) movement ecology to inform conservation strategies”*

Identified information gaps and research needs pertaining to monarch butterfly movement ecology that is necessary to inform conservation plans with recommendations for spatial arrangement of restored habitat patches to create a connected landscape for monarch butterflies in their summer breeding range. Conceived and developed innovative approaches,

including VHF radio telemetry, GIS, and next generation sequencing, to investigate adult and larval monarch movement behavior at the host plant, patch and landscape scales. Produced six 1st author publications.

Collaborative Projects:

The Iowa Monarch Conservation Consortium is a partnership of farmer and conservation organizations, state agencies, companies and Iowa State University. This collaboration devised and is facilitating adoption of the Iowa Monarch Conservation Strategy, which describes purposeful, coordinated voluntary conservation measures based on the best available scientific information. Implementation of the Iowa strategy will contribute to the long-term conservation of the monarch butterfly while maintaining agricultural productivity. In combination with the Iowa Monarch Conservation Consortium, I helped design, execute, and report studies to quantify effectiveness of prairie restoration practices at 50 sites across Iowa. Vegetation surveys along 100 m transects, including blooming flower identification and quantification, estimates of native and non-native species with a Daubenmier frame, and estimates of vegetation height with a Robel pole, were conducted annually in mid-June, mid-July, and mid-August. Based on results, strategies were developed to inform landowners of best practices.

Graduate Research Assistant, University of Delaware

2013-2015

M.S. Thesis: *“Evaluation of natural plant defenses on the growth, development, and survival of *Ostrinia nubilalis*”*

Although *Ostrinia nubilalis* is known as a major pest of corn prior to the introduction of Bt corn, it is considered generalist herbivore because of reports of presence on >200 plant species. This study investigated the growth, survivorship, and feeding preference of the Z-pheromone race *O. nubilalis* on a range of hosts that vary in defensive chemistries and historic degree of infestation to better understand the current host plant range. Non-Bt corn was found to be the most suitable host plant among those tested. Produced two 1st author publications.

Undergraduate Research Assistant, Widener University

2010-2013

“Impact of host plant on larval success of *Epimecis hortaria*”

Polyphagous insect herbivores may exhibit monophagous feeding behaviors due to patchy host plant distributions and limited dispersal mechanisms. The host plant species of *Epimecis hortaria* have uneven distributions across the eastern United States and are often patchily distributed within a single field site. In this study, we found significant effects of monophagous diets on *E. hortaria* caterpillar weight, pupal weight and adult weight.

Senior Thesis: *“Food choice preference throughout the lifespan of *Epimecis hortaria*”*

Monophagous diet had significant effects on fitness characteristics of *Epimecis hortaria* (larval, pupal, and adult weight). It was hypothesized that when presented with a choice, larvae would prefer to feed on hosts that will make them larger as adults, correlating with higher reproductive output and fitness. No choice and choice feeding assays were conducted with neonates, third, and fifth instars. No apparent preference was observed.

“Invertebrate Biodiversity in an Urban Setting”

Non-native ant species flourish from disturbance in city and captured natural habitats. Microhabitats created through urbanization (streets, curbs, grass, sidewalk, and buildings) may offer resources, division, and protection for invertebrates. Surveys of ant populations were conducted with pitfall traps. Sites with many microhabitats had higher biodiversity than sites with only one microhabitat.

“Do floral spiders limit pollination rate in pawpaw?”

Flower-dwelling spiders may prevent pollination because the spider could prey upon the pollinator. Twice weekly through the growing season, pawpaw flowers were inspected for flower dwelling spiders; at the end of the season, fruit yield was recorded. The intention was to look for a correlation between the presence/absence of flower-dwelling spiders and fruit yield. However, only one pawpaw fruit was produced.

PUBLICATIONS

* denotes equal contribution as first author

Published Research Articles

- Fisher, KE & SP Bradbury. 2022.** Plant abandonment behavior and fitness of monarch larvae (*Danaus plexippus*) is not influenced by an intraspecific competitor. *Journal of Insect Conservation*. doi: 10.1007/s10841-022-00408-0
- Fisher, KE & SP Bradbury. 2022.** Influence of habitat quality and resource density on breeding-season female monarch butterfly (*Danaus plexippus*) movement and space use in north-central USA agroecosystem landscapes. *Journal of Applied Ecology*. doi: 10.1111/1365-2664.14061
- Fisher, KE & SP Bradbury. 2021.** Estimating perceptual range of female monarch butterflies (*Danaus plexippus*) to potted vegetative common milkweed (*Asclepias syriaca*) and blooming nectar resources. *Environmental Entomology*. doi: 10.1093/ee/nvab058
- Fisher*, KE, PM Dixon*, G Han, JS Adelman, & SP Bradbury. 2021.** Locating large insects using automated VHF radio telemetry with multi-antennae array. *Methods in Ecology and Evolution*. doi: 10.1111/2041-210X.13529
Featured as journal cover image.
- Fisher, KE, BS Coates, & SP Bradbury. 2020.** Prediction of mitochondrial genome-wide variation using mitochondrion enrichment and next-generation sequencing methods. *Scientific Reports*. doi:10.1038/s41598-020-76088-0
- Fisher, KE, J Adelman & SP Bradbury. 2020.** Employing very high frequency (VHF) radio telemetry to recreate monarch butterfly (*Danaus plexippus*) flight paths. *Journal of Environmental Entomology*. doi: 10.1093/ee/nvaa019
- Fisher, KE, RL Hellmich & SP Bradbury. 2020.** Estimates of common milkweed (*Asclepias syriaca*) utilization by monarch larvae (*Danaus plexippus*) and the significance of larval movement. *Journal of Insect Conservation*. doi: 10.1007/s10841-019-00213-2
- Fisher, KE, JL Flexner & CE Mason. 2020.** Host plant preferences of Z-race *Ostrinia nubilalis* Hübner (Lepidoptera: Crambidae) based on plant tissue consumption rates. *Journal of Economic Entomology*. doi: 10.1093/jee/toaa047
- Fisher, KE, CE Mason, JL Flexner, J Hough-Goldstein & JH McDonald. 2017.** Survivorship of Z-pheromone race European corn borer (Lepidoptera: Crambidae) on a range of host plants varying in defensive chemistry. *Journal of Economic Entomology*. doi: 10.1093/jee/tox066

Published Articles Related to Improving the Climate & Accessibility of Ecological Research

- Boyd, A., **KE Fisher**, L. Lamb-Wotton, & R. Crystal-Ornelas. **2021.** Human Dimensions: The ESA Student Section. Ecological Society of America Bulletin Series "Extending the Vision: Highlighting the Human Dimensions of ESA". doi: 10.1002/bes2.1812
- Hansen, W, J Scholl, A Sorensen, **KE Fisher**, J Klassen, L Calle, G Kandlikar, N Kortessis, D Kucera, D. Marias, D Narango, K O'Keefe, W Recart, E Ridolfi & M Shea. **2018.** How do we ensure the future of our discipline is vibrant? Student reflections on careers and culture in ecology. *Ecosphere*. doi: 10.1002/ecs2.2099
- Krumm, JL, AA Nagengast, A Moretti, M Colgan, **KE Fisher**, KL Hy, RM Castellante & M Poslusny. **2014.** Summer research program on a shoestring budget: Increasing participation in undergraduate research. *Perspectives on Undergraduate Research and Mentoring*. 3(2): 1-10.

In Review/Preparation

- Grant*, T, **KE Fisher***, N Krishnan*, A Mullins, T Sappington, R Hellmich, J Adelman, J Coates, R Hartzler, J Pleasants, & SP Bradbury. Monarch butterfly ecology, behavior, and vulnerabilities in midwestern USA agricultural

landscapes: transdisciplinary research to support conservation decisions. *BioScience* (Revision submitted September 7, 2022).

Fisher, KE, BR Snyder, & SP Bradbury. Monarch butterfly (*Danaus plexippus*) foraging behavior and preferences. Journal of the Lepidopterists' Society. (Submitted June 9, 2022).

Fisher, KE, SP Bradbury, AD Wanamaker, & BS Coates. Quantifying spatial-temporal trends in continental-scale insect dispersal based on genetic and stable isotope variation. (in preparation).

SELECT PRESENTATIONS (complete list at end of document)

- 2022 **Fisher, KE**. Implications of movement ecology in conservation planning for monarch butterflies. United States Environmental Protection Agency (US EPA) Office of Pesticide Programs (OPP) Plant Technical Team (PTT) Research Briefing. July 21, 2022. Virtual. (invited)
Fisher, KE & RL Hellmich. Challenges and opportunities for promoting biodiversity in agroecosystems. International Congress of Entomology. Jul 17-22. Helsinki, Finland. (invited)
Fisher, KE, SP Bradbury, AD Wanamaker, & BS Coates. Monarch butterflies migrate to avoid the midwestern winter: Quantifying individual-level migration with stable isotope and genetic analyses. NCB Entomological Society of America. Mar 20, 2022. Minneapolis, MN. (invited)
- 2021 **Fisher, KE** & SP Bradbury. Estimating perceptual range of Female Monarch Butterflies (*Danaus plexippus*) to Potted Vegetative Common Milkweed (*Asclepias syriaca*) and Blooming Nectar Resources. American Chemical Society 2021 Virtual Meeting & Expo. Agrochemicals Division. Aug 22-26, 2021. Virtual Meeting.
- 2019 **Fisher, KE** & SP Bradbury. Estimates of common milkweed (*Asclepias syriaca*) utilization by monarch (*Danaus plexippus*) caterpillars. Annual Meeting of the North Central Branch of the Entomological Society of America. March 17 – 20, 2019. Cincinnati, OH. (3rd place award)
- 2018 Balder, T & **KE Fisher**. Mighty monarchs: Utilizing GIS for conservation questions. Iowa Technology and Geospatial Annual Conference. June 12 – 15, 2018, Des Moines, IA.

GRANTS

Awarded

Principle Investigator

Postdoctoral Seed Grant, Iowa State University Postdoctoral Association. Locating bumblebee (*Bombus* sp.) nest sites with VHF radio telemetry; \$2,400; July 2021-June 2022.

First-year Honors Mentor Grant, Iowa State University Foundation. Effect of intraspecific competition on monarch (*Danaus plexippus*) larval movement and survival; \$500; Mar 2019-May 2019.

FundISU Alumni Foundation, Monarch butterfly tracking (crowd-funding campaign). \$2,450 (from 9 donors to purchase radio telemetry transmitters); Jul 12, 2018-Aug 20, 2018.

Holohil Grant Program. Tracking monarch butterflies through the Iowa landscape utilizing an automated radio telemetry system; \$900 (to refurbish radio telemetry transmitters); Oct 15, 2017-Jan 15, 2018.

The Garden Club of America Board of Associates Centennial Pollinator Fellowship. Tracking monarch butterflies through the Iowa landscape utilizing an automated radio telemetry system; \$4,000; Mar 2017-Dec 2017.

Contributor

USDA/NIFA-AFRI. Factors influencing spatially explicit monarch population in Midwest agroecosystems (PI: SP Bradbury, J Adelman, J Coats, R Hartzler, and J Pleasants) \$670,675; Feb 1, 2018-Jan 31, 2021.

Honorable Mention

Principle Investigator

Ford Foundation Fellowships Program 2019 Dissertation Competition, the National Academies of Sciences, Engineering, and Medicine. Movement ecology of the monarch butterfly (*Danaus plexippus*): Understanding perception distance and utilization of resources; submitted Dec 2018 (\$25,000; Jun 2019-May 2020).

Not Awarded

Principle Investigator

- David H. Smith Conservation Postdoctoral Research Fellowship, Society for Conservation Biology. Characterizing the impact of landscape composition on bumble bee space use for nesting, foraging, and overwintering to inform conservation strategies in fragmented midwestern U.S. agroecosystems. Mentors: D Cariveau & J Koch. Submitted Sep 24, 2021. (\$161,000; May 2022-April 2024).
- The Michigan State University Presidential Postdoctoral Fellowship in Ecology, Evolution, and Behavior. Quantifying habitat utilization by bumble bee colonies for foraging and locating nest sites in Michigan agroecosystems. Mentors: N Haddad, D Landis, D Cariveau & J Koch. Submitted Nov 12, 2021. (\$136,000; May 2022-April 2024).
- USDA/NIFA-AFRI Education and Workforce Development Program, Postdoctoral Fellowship. Quantifying spatial-temporal trends in continental-scale insect dispersal based on genetic and stable isotope variation. Mentors: AD Wannamaker, BS Coates, and SP Bradbury. Submitted Aug 13, 2020. (\$165,000; June 2021-May 2023).
- The Garden Club of America Fellowship in Ecological Restoration. Guidelines for prairie restoration based on monarch butterfly (*Danaus plexippus*) movement biology; submitted Dec 2018 (\$8,000; Apr 2019-Dec 2019).
- Xerces Society Joan Mosenthal Dewind Grant. Effect of intraspecific competition on monarch (*Danaus plexippus*) larval movement and survival; submitted Dec 2018 (\$3,750; Apr 2019-Dec 2019).
- Prairie Biotic Research, Inc. Small Grant. Stable isotope analysis of migratory monarch butterflies to investigate migratory patterns and inform conservation strategies; submitted Dec 2018 (\$1,500; Jan 2019-Dec 2019).
- The Garden Club of America Board of Associates Centennial Pollinator Fellowship. Landscape scale movement: Utilizing automated radio telemetry to guide monarch butterfly habitat restoration; submitted Feb 2018 (\$4,000; Mar 2017-Dec 2017).
- Prairie Biotic Research, Inc. Small Grant. Landscape scale movement: Tracking monarch butterflies with radio telemetry to guide prairie restoration; submitted Dec 2017 (\$1,500; Jan 2018-Dec 2018).

Contributor

- Presidential Interdisciplinary Research Seed Grant Program, Iowa State University. Assessing monarch butterfly (*Danaus plexippus*) full mitochondrial DNA genome variation to support a national conservation strategy (PI: SP Bradbury and B Coates); submitted Feb 2018 (\$47,530; Sep 2018-Dec 2020).
- Bailey Research Career Development Award, Iowa State University. Understanding monarch butterfly (*Danaus plexippus*) dispersal using full Mt DNA genome sequencing (PI: SP Bradbury and B Coates); submitted Oct 19, 2017 (\$141,101; Jan 1, 2018-Dec 31, 2020).
- USDA/NIFA-AFRI, A method to study insect dispersal by detecting haplotype variation using full mitochondrial genome enrichment and Illumina sequencing (PI: SP Bradbury and B Coates); submitted May 24, 2017 (\$99,983; Jan 1, 2018-Dec 31, 2019).
- NSF/Integrated Organismal Systems, Pre-proposal. Fitness in a fragmented landscape: revealing the role of resource-perception capacity in a wild insect (PI: SP Bradbury, J Adelman, T Grant, R Hellmich, T Sappington), submitted Jan 19, 2017 (Apr 15, 2018-Apr 14, 2021).
- USDA/NIFA-AFRI. Factors influencing spatially explicit monarch population responses in midwest agroecosystems (PI: SP Bradbury, J Adelman, J Coats, R Hartzler, R Hellmich and J Pleasants); submitted Jul 18, 2016 (\$499,004; Oct 2016-Sep 2019); invited to re-submit in 2017.
- CAMTech I/UCRE, Pre-proposal. Identification of monarch mitochondrial haplotypes based on direct sequencing (PI: SP Bradbury and B Coates); submitted Jun 16, 2016 (\$130,000; Jan 1, 2017- Dec 31, 2018).

SKILLS

Gallup Clifton Strengths Finder

1. **Learner:** Great desire to learn & wants to *continuously improve*.
2. **Discipline:** Enjoys *routine & structure*; creates *order*.
3. **Achiever:** *Works hard* & possesses a *great stamina*; takes immense satisfaction being *busy & productive*.
4. **Focus:** *Takes direction, follows through, & makes corrections* to stay on track; *prioritizes before acting*.
5. **Individualize:** Intrigued with the unique qualities of each person; has a gift for figuring out how *different people can work together productively*.

“People with dominant executing themes know how to make things happen.”

Field Skills

Plant and insect identification, vegetation surveys with Daubenmier frames and Robel poles, GPS, animal tracking with handheld and automated VHF radio telemetry, collect core samples from living trees with increment borer

Spatial Analysis & Interpretation

Programs & Packages: R/RStudio (raster, sp, rgdal, ctmm, IsoriX, and bioRad packages); ArcGIS; PathFinder; GeoDa; ERDAS IMAGINE; Location of a Signal (LOAS); Geospatial Modeling Environment (GME)

Experience with Remote Sensing Data: Landsat, satellite imagery, and landcover classifications; aerial images/orthophotos; weather radar

Specific Training:

Colorado State University Aeroeco Lab: Radar Aeroecology Workshop (Aug 2022)

Five-day immersive training in the use of weather surveillance radar data for applications in aeroecology (birds, bats, and insects). The basics of radar remote sensing, data visualization, and data processing were covered.

AniMove: Statistics for Animal Tracking Data (Feb 2019)

Five-day professional training course, targeted toward students, researchers and conservation practitioners that have collected animal relocation data who want to learn how to analyze these data using continuous time movement models (ctmm). Course participants apply learned techniques to their own data during the course.

GIS Certification through Iowa State University Community & Regional Planning Department

The Department of Community and Regional Planning (CRP) offers a multidisciplinary graduate certificate in Geographic Information Systems (GIS). The GIS Certificate Program is open to graduate students in all disciplines of the university. Students must complete a minimum of 13 graduate credits of GIS coursework to receive the certificate. In addition, students must maintain a grade-point average of B or higher in these courses.

- CRP 551: Introduction to Geographic Information Systems (Sp 2017)
Introduction to geographic information systems, including discussions of GIS hardware, software, data structures, data acquisition, data conversion, data presentation, analytical techniques, and implementation procedures. Laboratory emphasizes practical applications and uses of GIS.
- NREM 546: Integrating GPS and GIS for Natural Resource Management (Fa 2017)
Emphasis on the use of GPS as a data collection tool for GIS. Basic theory of GPS. Use of Global Positioning System technology for spatial data collection and navigation. Post-processing and real-time correction of GPS data. GPS data transfer to GIS for mapping applications. Use of GIS to construct waypoints for use in GPS navigation.
- STAT 406: Statistical Methods for Spatial Data (Sp 2018)
The analysis of spatial data; geostatistical methods and spatial prediction; discrete index random fields and Markov random field models; models for spatial point processes.
- CRP 552: Geographic Data Management and Planning Analysis (Sp 2019)
Extensive coverage of geo-relational database concept and design, GIS database creation and maintenance, geographic data manipulation and analysis. GIS output generation and geographic data presentation. Laboratory emphasizes practical applications & uses of GIS.

Laboratory Skills

DNA extraction with DNEasy DNA extraction method and phenol-chloroform DNA extraction method; cellulose extraction from tree core samples, polymerase chain reaction (PCR) and reverse transcription polymerase chain reaction (RT-PCR); gel electrophoresis; preparing samples for Sanger sequencing and next-generation sequencing (NGS) with Illumina; preparing samples for $\delta^2\text{H}$, $\delta^{13}\text{C}$, $\delta^{15}\text{N}$, and $\delta^{18}\text{O}$ stable isotope analysis on Costech Elemental Analyzer, Thermo Finnigan TC/EA (thermochemical elemental analyzer), and Picarro L2130-i Isotopic Liquid Water Analyzer; insect and plant rearing

Analysis & Interpretation of DNA Sequencing Results

Programs & Packages: Unix shell commands (GitBash) for bioinformatics analyses; Slurm job scheduler; FastQC; Trimmomatic; Bowtie2; SAMtools; BCFtools; SOAPdenovo2; SPAdes; BLASTn; PoPoolation2

Specific Training:

One-on-one training with Drs. Maryam Sayadi and Andrew Severin at the Genome Informatics Facility at ISU 2019

Additional Tools

Proficient in Microsoft Word, PowerPoint, and Excel

Accomplished in R/RStudio for data formatting, statistical analyses, and data visualization

Experienced with Git/GitHub/GitBash for data management and coding

Specific Training:

“The Basics of R (for ecologists)” training course <https://www.rforecology.com/> 2022

TEACHING EXPERIENCE

Guest Instructor

Iowa State University GEOL 426/526: Stable Isotopes in the Environment Fall 2021

Course Description: Introduction to the theory, methods and applications of stable isotopes. Primary focus on the origin, natural abundance, and fractionation of carbon, hydrogen, oxygen, nitrogen isotopes. Applications of isotopic occurrence for elucidation of physical, chemical, biological, and environmental processes. Effects of plant physiology, photosynthesis, trophic structure, diffusion, evaporation, chemical precipitation, soil and atmospheric processes, and environmental factors on isotope abundance.

- Guest instructor on topics related to ecology (trophic interactions & animal migration)
- Fostered inquisitive thought by facilitating independent research projects

Teaching Assistant

Iowa State University ENT 370: Insect Biology Fall 2018

Course Description: Structure, physiology, evolution, behavior, life histories, & recognition of insects. Collection required.

- Ran laboratory section with weekly lectures, biweekly quizzes, insect collecting, insect preserving, and grading.
- Class Climate: Overall rating as an instructor = 4.45/5
- Student Feedback: “Kelsey was very helpful and a great teacher whenever I had questions. She really cares about the students and it is evident that this is a subject that she is very passionate about, which makes the subject more interesting.”

Iowa State University: Master Gardener Training 2016 & 2017

- Ran laboratory section to familiarize master gardener trainees with common insect pests

Training

Center for the Integration of Research Teaching and Learning – Certified associate 2019

- Obtained understanding of evidence-based teaching and of strategies to help students learn through community and diversity
- Attended five professional development events on student learning

Additional Courses

- An Introduction to Evidence-based Undergraduate STEM Teaching 2022
 - This massive open, online course (MOOC) is designed to provide aspiring faculty in STEM disciplines with an overview of effective college teaching strategies and the research that supports them. The goal of the eight-week course is to equip the next generation of faculty to be effective teachers, thus improving the learning experience for the thousands of students they will teach.

Iowa State University’s Center for Excellence in Learning and Teaching Workshops

- CELT Talks: Large Enrollment Classes 2022
- Ethical Dilemmas in the College Classroom: A Case Studies Workshop 2022
- Good Class Bad Class – Intentions vs. actions in classroom teaching by Raj Raman 2019
- Conversation: Navigating controversial topics in the classroom 2018
- How Can I Do This Better Next Time Around? 2018
Implementing backward design into your classroom
- Teaching Symposium for Fall 2018 Teaching Assistant Cohort 2018

Iowa State University’s Health & Wellness Ally Trainings

- Green Dot (Violence Prevention) 2022
- Question, Persuade, and Refer (QPR) Gatekeeper Training for Suicide Prevention 2022

Mentor for Undergraduate Students

Technical Supervisor for Undergraduate Students 2013-2020

- Direct, supervise, and delegate research responsibilities associated with research projects to technician employees
- Responsible for 27 students since 2013; as many as 6 at one time

Mentored students through independent research projects 2015-2020

- Guided students in scientific method from hypothesis formulation to presentation of results
- Empowered undergraduate students to take lead on projects
- Taught time management and communication skills
- Led weekly journal discussion on relevant literature
- Aided in formation of job application materials

Iowa State University 2017-2020

Animal Ecology Independent Study

- Undergraduate Animal Ecology students can earn course credit for working on projects with a lab group.
 - “Monarch butterfly floral resource preferences”
 - “Feeding behavior of monarch larvae: Is there a preference for new vegetation?”
 - “Observations of monarch butterfly interactions with plant resources in Iowa”
 - “Exploring the motivation for monarch caterpillar movement”
 - “Literature review of the best management practices for monarch habitat”
 - “Literature review on impacts of roadsides and agriculture fields on monarch productivity and survival”

First-Year Honors Mentor Program

- Each spring, first-year Honors students are offered an opportunity to experience the world of research firsthand by working under the guidance of an Iowa State faculty mentor or graduate student.
 - i. “Milkweed biomass consumption by monarch caterpillars”
 - ii. “How sharing milkweed with other larvae affects behavior and weight gain”
 - iii. “The effects of monarch larval interactions on survival and fitness”

IINSPIRE LSAMP

- The Iowa, Illinois, Nebraska Louis Stokes Alliance for Minority Participation is a Midwest STEM partnership for innovation in research and education. The alliance is committed to broadening the participation of underrepresented minorities in STEM education in the Midwest.
 - i. “Monarch larval movement on common milkweed”

George Washington Carver Intern Program

- The program seeks to improve the research enterprise through increased diversity; champion the value of graduate education; and prepare and recruit the best and brightest for undergraduate and graduate education at ISU. The internship program further seeks to bridge the gap between lack of access to technology/information and opportunities to engage in experiential learning in an effort to increase the participation of students of color in STEM fields.
 - i. “Flying time of monarch butterflies equipped with radio transmitters”

University of Delaware

2015

Senior Thesis

- Undergraduate students conduct a multiple semester research project, analyze results, write thesis, and present to thesis committee.
 - i. “The non-maize oviposition preferences of the European corn borer (*Ostrinia nubilalis*) in relation to larval survival”

Adviser for K-12 Programs

State Science and Technology Fair of Iowa – Junior High Judge 2019 & 2021

Science Fair – Project Mentor 2018-present

- Helped middle and high school students design an experiment, collect data, analyze results, & present research at a regional science fair.
 - i. “Evaluating monarch flight with a transmitter prototype”
 1. Presented at a regional Entomological Society of America meeting
 2. Awarded third place in the undergraduate research poster competition.
 - ii. “How do induced defenses in common milkweed (*Asclepias syriaca*) affect monarch (*Danaus plexippus*) larval mass and plant biomass consumption?”

PlantingScience – Master Team Liaison & Mentor 2015-present

- PlantingScience is a learning community where scientists provide online mentorship to student teams as they design and think through their own inquiry projects. The program is a collaborative engagement in science education that includes traditional, hands-on and technology-enhanced learning.
 - Scientific mentor for students
 - Liaison between PlantingScience team, teachers, & mentors

Girl Scouts of America: Gold Award – Project Advisor 2018

- Taught high school student about monarch butterfly conservation as she worked toward the highest achievement possible through the Girl Scouts of America
- Designed and planted a butterfly garden
- Helped educate the public on the importance of milkweed and nectar sources

EXTENSION EXPERIENCE

Science Communication Training

Story-Tell Your Science with ComSciCon: The Communicating Science Workshop for Graduate Students 2019

- The purpose of this workshop was to facilitate the improvement of graduate student's abilities to describe their research as an exciting narrative. This 5-hour workshop is modeled after a ComSciCon workshop and fueled by graduate student interest. Topics covered with a diverse panel of scientific communicators will include: describing science to other scientists in different fields and communicating science to non-scientists.
 - Organized and participated in half day workshop on effective scientific communication.

Extension Intern with Dr. Erin Hodgson 2017

- Learned about extension philosophy and developed my extension philosophy
- Coauthored two Integrated Crop Management (ICM) News articles
- Planned, organized, and participated in a field day demonstration (Iowa Monarch Conservation Summit & Field Day)
- Collected and curated a "Common Butterflies of Iowa" insect display

Science Communication Fellow – Reiman Gardens, Ames, IA Portal to the Public 2017

- Science Communication Fellows are scientists, engineers, graduate students, researchers, and other science-based professionals who have been certified through Portal to the Public as current science ambassadors and excellent communicators
 - Attended three professional development workshops
 - Developed and presented a hands-on activity focused on my research
 - i. Science Communication Fellow Showcase
 - ii. Meet a Scientist Day
 - iii. Butterfly Blizzard

Science Communication Experience

ISU Extension: Research Farm Field Days

Topic: Norther and Western Corn Rootworm

- | | | |
|------|---|---------|
| i. | Northwest Research and Demonstration Farm in Sutherland, IA | Jul '22 |
| ii. | Northern Research and Demonstration Farm in Kanawha, IA | Jul '22 |
| iii. | Northeast Research and Demonstration Farm in Nashua, IA | Jul '22 |
| iv. | Armstrong Memorial Research and Demonstration Farm in Lewis, IA | Jun '22 |

Topic: Monarch Butterfly

- | | | |
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| i. | Field Extension Education Laboratory Farm in Boone, IA | Jul '18 |
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Invited Presentations (General Public Audiences)

Topic: Scientific Communication and Outreach

- | | | |
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| i. | Ecological Society of America: Education and Community Engagement
Formal and Informal Opportunities, virtual panel discussion | Sep '22 |
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Topic: Monarch movement and behavior ecology informs effective habitat restoration

- | | | |
|------|--|---------|
| ii. | Des Moines Audubon Society in Des Moines, IA | Oct '22 |
| iii. | Big Bluestem Audubon Society in Ames, IA | Sep '22 |
| iv. | Monarch Day at the Blank Park Zoo in Des Moines, IA | Sep '22 |
| v. | University of Costa Rica exchange students Field Day at ISU FEEL Farm in Boone, IA | Aug '22 |
| vi. | Iowa Conservation Education Coalition in Decorah, IA | Jul '21 |
| vii. | Iowa Pheasants Forever & Quail Forever Convention in Des Moines, IA | Jan '20 |

- viii. Learn on Saturdays at Des Moines Botanical Garden in Des Moines, IA Jan '19
- ix. Iowa Monarch Conservation Summit & Field Day at ISU FEEL Farm in Boone, IA Jul '18
- x. Iowa Turfgrass Conference & Trade Show in Altoona, IA Jan '18
- xi. Butterfly Blizzard at Reiman Gardens in Ames, IA Dec '17
- xii. Meet a Scientist Day at Reiman Gardens in Ames, IA Jun '17
- xiii. Science Communication Fellow Showcase at Reiman Gardens in Ames, IA Apr '17
- xiv. IA Farm Progress Show in Boone, IA Aug '16, '22

Topic: Monarch butterfly migration, conservation, and life cycle with live insects

- i. Water Rocks! Teacher Summit in Ames, IA Jun '22
- ii. FARM Dinner: Farming and Agriculture – a relationship that matters by ISU extension in Boone, IA Sep '19
- iii. Social Irrigation at Des Moines Botanical Garden in Des Moines, IA Sep '18, '19
- iv. Iowa State University Conservation Club in Ames, IA Apr '18
- v. Pollinator Fest at Reiman Gardens in Ames, IA Jul '17, '18
- vi. Monarchs & Music in Elkader, IA May '17
- vii. Pollinator Palooza at Ames Library in Ames, IA Jan '17

Invited Presentations (K-12 Audiences)

Topic: Insect diversity, ecology, & biology

- i. ISU Entomology Student Organization – Insect Film Festival in Ames, IA Nov '16-'19
- ii. Visit to Girls in STEM Club at Morris Elementary in Des Moines, IA Oct '19
- iii. Working with Animals Camp at White Clay Creek State Park in Newark, DE Jul '14, '15
- iv. Classroom visit to Tatnall Middle School in Wilmington, DE Sep '13, '14, '15

Topic: Scientific research & career opportunities in ecology

- i. Native Bee Challenge 2019 Ag Innovators Experience Training Feb & Mar '19
- ii. "Taking the Road Less Traveled" STEM Careers Conference for girls Oct & Nov '18
- iii. Monarchs on the Move 2018 Ag Innovators Experience Training Jan & Feb '18
- iv. Ames High School classroom visit & assembly Sep '17, Dec '18

Written Communication

Science Communication Blogs

Iowa Monarch Conservation Consortium – @IowaMonarchs

- i. "Tracking monarch butterfly movements" Jun '21
- Methods in Ecology and Evolution Official Blog – methods.blog
- i. "The journey from designing to employing an automated radio telemetry system to track monarch butterflies" Nov '20
- IA State Integrated Crop Management
- ii. "Floral resources that support the monarch butterfly" Apr '20
 - iii. "Update on Monarch Butterflies in Iowa" May '17
 - iv. "Monarch Southern Migration in Progress" Sep '17

Letters to a Pre-Scientist Program

- i. Pen-pal with elementary school student in a high-poverty school to demystify science careers '14-'20

Interviewed by Media Outlets

- 2022 "Let's Talk Monarchs! – Why are monarchs orange?", Iowa Monarch Conservation Consortium
- "Let's Talk Monarchs! – Is a monarch an insect?", Iowa Monarch Conservation Consortium
- 2021 "All About POLLINATORS!", Water Rocks! Live Streaming
- 2020 "Deep Tracks Only: Radio Telemetry Blazes a Path for Monarch Habitat Restoration", Entomology Today
- 2018 "Alumni Corner: Biology Alumna Kelsey Fisher Studies Monarch Butterfly", Widener University
- "ISU Student Using Radio Telemetry to Track Monarch Butterflies", Ames Tribune
- "Three Minute Thesis (3MT®) Finalists", Iowa State University

- 2017 “Tracking Monarch Butterflies”, Agriculture Business Report WHO Channel 13, Des Moines, IA
 “At Iowa State, Teams Studying Monarchs are Female”, Daily Times Herald, Carroll, IA
 “Float like a Butterfly, Research like a Scientist”, Iowa State University
- 2016 “Milkweed, Monarchs, and Models”, Iowa State University

PROFESSIONAL DEVELOPMENT

The Postdoc Academy: Building Skills for a Successful Career

2022

The Postdoc Academy provides skill development for postdocs as they prepare to transition into their next career step. Using inclusive, active-learning approaches, participants will build skills to (1) inform your approach to leadership, (2) build and supervise a team, (3) manage projects, (4) apply teaching skills beyond the classroom, (5) develop strategic communication skills and (6) prepare successful job application materials.

- Describe the key attributes of leadership frameworks to apply to a current or future role
- Reflect on and practice supervision strategies to build and manage an effective team
- Apply concepts of project management
- Describe effective teaching skills that are applicable in multiple workplace environments and apply them to several professional scenarios
- Apply assets & strengths to create engaging & strategic responses for interview questions
- Communicate strengths to potential employers in the job application process

Using Rules of Life to Address Societal Challenges: NSF-Sponsored Workshop & Incubator Series

2022

NSF-sponsored workshop and incubator series to bring together a multi-disciplinary group of researchers to address societal challenges. Each workshop considered how all the STEM disciplines (including biology, chemistry, computer sciences, engineering, geosciences, mathematics, physics, social, behavioral, and economic sciences) could be used to tackle a specific problem. All workshops incorporated cross-cutting themes of diversity, equity, and inclusion and STEM education, training, and workforce development. Kick-off, wrap-up, and two writing incubators provided an opportunity to develop project ideas and brainstorm future research directions, and serve as a platform to connect with postdoc peers from a variety of scientific backgrounds.

- Achieving a Sustainable Future Workshop:
We are learning the Rules of Life that govern the complexity of interconnected living systems at multiple scales, e.g., from natural and synthetic cells to organisms, populations, communities, ecosystems, and the biosphere. As we learn more about the ways that living systems use and re-use natural resources, how might these lessons help us devise strategies to improve sustainability?

Start Smart Salary Negotiation Workshop by the American Association of University Women (AAUW)

2022

Negotiations can increase the potential to earn higher salaries and better benefits packages. By negotiating fair and equitable salaries, you will be better able to pay off loans, buy the things you want and need, and even save for retirement. AAUW Start Smart is specifically designed to teach you how to negotiate salaries for a new job. In every two-hour workshop you will gain confidence in your negotiation style through facilitated discussion and role-play and learn:

- How to identify and articulate your personal value
- How to develop an arsenal of persuasive responses and other strategies to use when negotiating
- How to conduct objective market research to benchmark a target salary and benefits
- About the wage gap, including its long-term consequences

Professional Advancement Career Training (PACT) with the Entomological Society of America

2021-2022

Six-month program that aided in identifying areas of strength and opportunities for growth. Each month of the program will focus on a unique theme in leadership and soft-skill development.

- Topics included: networking, emotional intelligence, communication and listening, management and teamwork, cultural competence and inclusion, resilience and leadership
- 360-degree personal evaluation, monthly webinar, calls with a paired mentor (Jeff North) and guided group discussion (Jamie Blow) with peers using the *MentorCity* platform

Preparing Future Faculty Program at Iowa State University

2019

The Preparing Future Faculty (PFF) program supplements departmental graduate preparation by offering additional teaching, mentoring, and learning possibilities. These enriching experiences help prepare postdoctoral fellows, Ph.D. students, and master's students for an academic career and provide further credentialing to be competitive on the academic job market. The overarching goal of PFF is to better prepare graduate students and post docs for faculty careers at a variety of institutions through a combination of seminars, mentoring, and practical classroom and departmental service experiences.

- Learned to give and receive constructive criticism through team-based learning
- Met twice monthly with a teaching mentor tenure-track faculty member
- Attended and reflected on weekly panel discussions to gain insight and advice from current faculty members at various institutions

Interdisciplinary Writing Consultant – Center for Communication Excellence at ISU

- The center for communication excellence provides effective specialized programming, opportunities for practice and improvement, and a range of resources – all grounded in the study of communication genres and in the scholarship of teaching and learning. Leveraging innovative practices, transdisciplinary collaborations, creative endeavors, and cutting-edge technologies, the center promotes professional development through individual and community support culminating in transformative learning experiences.

- Received semester-long training to advise on writing conventions of various types of academic and professional genres

2019

- Served as an Interdisciplinary Writing Consultant

2020-2021

- i. Conducted one-on-one writing consultations with graduate students
- ii. Facilitated writing groups and workshops
 - “Designing effective posters”; “Composing your cover letter”; “Research Article Discussion and Conclusions”; “Writing an USDA/NIFA grant application”
- iii. Assisted in developing resources for professional communication
- iv. Served as an ambassador for graduate students as they navigate writing and scholarship expectations

MEMBERSHIP IN PROFESSIONAL SOCIETIES

Society for Conservation Biology	2021-present
American Chemical Society - AGRO	2020-present
The Wildlife Society	2019-present
<ol style="list-style-type: none"> i. Spatial Ecology & Telemetry Working Group ii. Student Development Working Group 	
Botanical Society of America	2017-present
Entomological Society of America	2013-present
<ol style="list-style-type: none"> i. Eastern Branch ii. North Central Branch iii. Plant-Insect Ecosystems (PIE) Section 	

Ecological Society of America

2011-present

- i. Applied Ecology Section
- ii. Communication & Engagement Section
- iii. Student Section

AWARDS & HONORS**University Awards****Iowa State University**

Graduate & Professional Student Senate Research Award	2021
<ul style="list-style-type: none"> ▪ Recognizes graduate students at Iowa State University who vastly contribute to the larger research community. By producing numerous publications, by having many first authorships, and by publishing in high-impact journals (\$200) 	
Graduate Research Excellence Award	2020
<ul style="list-style-type: none"> ▪ Recognizes graduate students for outstanding research accomplishments as documented in their dissertations. The purpose of these awards is to recognize graduate students for outstanding research accomplishments as documented in their theses and dissertations. These students are also expected to be academically superior and able not only to do research, but also to develop a well written product. The intent of this program is to recognize "the best of the best" graduating students who have submitted dissertations. 	
Department of Entomology – Jim Oleson Scholarship in Entomology	2020
<ul style="list-style-type: none"> ▪ Awarded on the basis of academic promise and initiative (\$1,000) 	
Department of Entomology – Larry Pedigo Graduate Scholarship in Entomology	2019 & 2020
<ul style="list-style-type: none"> ▪ Selection is based on scholarly performance including: participation in academic, scholarly, or professional organizations, elections to honor societies, and receipt of academic awards or honors (\$2,000) 	
Brown Graduate Fellowship	2019
<ul style="list-style-type: none"> ▪ Used to strategically advance ISU research in science, agriculture, and space science (\$10,000); One of twelve recipients 	
Department of Entomology – Entomology Alumni Scholarship	2018 & 2020
<ul style="list-style-type: none"> ▪ Selection is based on scholarship, leadership potential, extracurricular activities, work and community experience, and on promise for a career in Entomology (\$2,000) 	
Three Minute Thesis (3MT®)	2018
<ul style="list-style-type: none"> ▪ In the fall of each year, the Graduate College sponsors a Three-Minute Thesis Competition to challenge Iowa State graduate students to clearly and concisely articulate their research to a non-specialist audience. Participants are provided three minutes and one static slide to convey their message. Each year, there are approximately 80 participants in eight preliminary heats and the final event consisted of a winner representing each heat. ▪ One of eight heat winners 	
Graduate & Professional Student Senate Leadership Award	2018
<ul style="list-style-type: none"> ▪ Awarded to a student that demonstrates excellence in leadership that exemplifies "going above and beyond" (\$200) 	
Professional Advancement Grant	
<ul style="list-style-type: none"> ▪ Travel awards provided by the Iowa State University Graduate and Professional Student Senate <ol style="list-style-type: none"> i. \$200 for oral presentation at NCB-Ent Soc in Oklahoma City, OK ii. \$200 to attend AniMove Animal Tracking Data workshop in Front Royal, VA iii. \$200 for poster presentation at ESA in Portland, OR 	2020 2019 2017

- iv. \$180 for poster presentation at ESA in Ft. Lauderdale, FL 2016

University of Delaware

Entomology Departmental Travel Award

- i. \$1000 travel award for oral presentation at ESA in Baltimore, MD 2015
 ii. \$1000 travel award for oral presentation at Ent Soc in Minneapolis, MN 2015

Widener University

Nicholas D. Caputo Biology Student-Faculty Research Collaboration Award 2012

- Selected by biology faculty for active involvement in research and excellent academic achievement (\$130)

College of Arts & Sciences Summer Research Symposium Third Place Poster Presentation 2010

Professional Society Awards

Entomological Society of America

North Central Branch Graduate Student Scholarship 2020

- This \$500 scholarship recognizes graduate student members of the North Central Branch (NCB) of the Entomological Society of America for their course work and research culminating in scholarship

North Central Branch Student Presentation Competition

- i. Third Place Paper: Session 1 Ph.D. P-IE 2019
 ii. Third Place Paper: Session 2 Ph.D. P-IE 2018

North Central Branch \$200 student travel award

- i. Cincinnati, OH 2019
 ii. Madison, WI 2018

Ecological Society of America

Real/Brown Travel Award \$300 travel award; Ft. Lauderdale, FL 2016

Honors

Gamma Sigma Delta, *Honor Society of Agriculture* 2017

Sigma Alpha Pi, *National Society of Leadership and Success* 2012

Beta Beta Beta, *National Biology Honors Society* 2011

Order of Omega, *National Greek Leadership and Honors Society* 2011

SERVICE

Service as a Journal Reviewer or Subject Editor

Reviewer

Insects 2022
 Landscape Ecology 2022
 Journal of Insect Conservation 2022
 Ecological Entomology 2021
 PLOS ONE 2021

Subject Editor

Annals of the Entomological Society of America

- Special Feature: Using Integrated Observational, Mechanistic, and Experimental Research Approaches to Drive Conservation Decisions: Lessons from Butterfly Species in Peril 2020

Service to Professional Societies

Ecological Society of America

Communication & Engagement (C&E) Section – <i>Secretary</i>	2022-2024
<ul style="list-style-type: none"> • Serve on the leadership team and empower ecologists to a) professionalize science communication and engagement efforts and b) mentor ecologists interested in trying or learning skills, enhancing communication and engagement efforts, or transitioning to #scicomm and #scienceengagement careers. • Keep the records of the Section, including a current membership and mailing list • Communicate Section activities through an electronic newsletter 	
Student Section – <i>Chair, Vice Chair, Treasurer</i>	2015-2018
<ul style="list-style-type: none"> • Worked with a team of passionate students to better the Ecological Society of America student experience • Planned/organized/lead workshops at the annual meeting: “confessions from graduate students”, student orientation, student networking, scientific communication, “stories from scientists”, NSF funding • Led biweekly teleconferences with leadership team to foster collaboration and progress on student section initiatives • Effectively communicated regularly with ESA executive board members and staff • Attended governing board meetings • Led coordination of liaisons between the student section and other ESA sections • Managed finances (Max \$15,000) 	
Extending the Tent Task Force – <i>Student Representative</i>	2018
<ul style="list-style-type: none"> • To enhance ESA’s relevance and increase diversity of all kinds, Richard Pouyat (ESA President) created the Extending the Tent Task Force consisting of representatives from across ESA. The overall charge of the Task Force is to (1) develop a vision for ESA membership for the next 20 years that addresses inclusion, diversity (in professional and employment sectors), and engagement (with other disciplines, practitioners, the public, and policy makers) and (2) devise a strategy to achieve this vision. 	
ESA Career Fair – <i>Organizing Committee</i>	2018
<ul style="list-style-type: none"> • Organized a 4-day long career fair at the 2018 ESA Annual Meeting in New Orleans. Activities included, interview demos, resume reviews, mini workshops, and panel discussions. Planned schedule; recruited speakers and reviewers; lead discussions. 	
EcoFutures Initiative – <i>Coordinator & Contributor</i>	2016
<ul style="list-style-type: none"> • Collaborated with 14 graduate students across the country through student lead workshops and discussions to identify and remedy the prospective challenges and opportunities of 21st century ecologists. Manuscript printed in Ecosphere. 	
Organized Workshops at National Ecological Society of America Meeting	
<ul style="list-style-type: none"> i. Confessions from Graduate Students: Advice from Graduate Students about Navigating and Surviving Graduate School ii. The Lefts, Rights, Ups, and Downs That Created a Successful Career in Ecology iii. Story-Tell Your Science with ComSciCon: The Communicating Science Workshop for Graduate Students iv. Student Networking Workshop: Tips on How to Build and Maintain Productive Relationships v. Maximize Your Meeting Experience: Orientation and Networking for Student Attendees vi. Student Section Mixer and Student Section Business Meeting 	<p>2016 & 2018</p> <p>2018</p> <p>2018</p> <p>2017 & 2018</p> <p>2016-2018</p> <p>2016-2018</p>

Entomological Society of America

Science Policy Fellow	2022
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The Science Policy Fellows (SPF) program is a two-year active training program to teach entomologists the skills needed to successfully advocate for the discipline. The training focuses on federal policy in Washington, D.C. Each year five applications are selected by during a competitive application process. ESA SPFs engage in a variety of virtual and in-person educational events to teach them about how science policy and science funding decisions are made at the federal level, and to provide them an opportunity to engage with lawmakers, legislative staff, and federal agency leaders in Washington, D.C. Active training lasts for two years, at which time SPFs become alumni and form the core of ESA's advocacy team, representing the science in their legislative districts.

Typical activities for an ESA Science Policy Fellow include:

- Attend science and policy workshops and networking events at ESA's Annual Meeting (receive gratis registration and \$500 travel stipend)
- Participate in teleconferences and webinars on federal science policy and budget development, as well as specific policy issues
- Assist in the development of policy statements
- Participate in Washington, D.C.-based meetings and events for hands-on experience with legislators, legislative staff, and agency leaders (all travel expenses covered by ESA)

Organized Symposia at National Entomological Society of America Meeting

- 'Tis the Season to Be Freezin': Highlighting Early-Career Entomologists Investigating Insects in Relation to Cold Temperatures 2022
- Using Integrated Observational, Mechanistic, and Experimental Research Approaches to Drive Conservation Decisions: Lessons from Butterfly Species in Peril 2019

North Central Branch Student Affairs Committee – *Treasurer, Iowa State University Representative* 2018-2021

- Collaborated with students across the region on student-related activities and initiatives
- Managed finances; filed budget requests with branch treasurer
- Aided North Central Branch Treasurer/Secretary with tasks as needed
- Communicated the needs of Iowa State University students to the Student Affairs Committee
- Informed Iowa State University students of opportunities and initiatives through the North Central Branch
- Volunteered at branch meetings

Regional Entomology Games Competitor (formerly known as Linnaean Games) 2014-2019

American Chemical Society – AGRO

Organized Symposia at National American Chemical Society Meeting

- Early Career Symposium:
Chemical Communication between Living Organisms in Agricultural Systems 2021

University Service

Iowa State University

University Committee for the Advancement of Women and Gender Equality – *Grad Student Rep* 2018-2020

- The University Committee for the Advancement of Women and Gender Equity (UCW) has diverse membership from across the Iowa State University campus. UCW is an active and involved committee that works to advance gender equity within the university community.

Entomology Graduate Student Organization – *Vice President* 2017-2018

- The Entomology Graduate Student Organization (EGSO) is a graduate student-run organization within the Department of Entomology at Iowa State University. It exists to assist Entomology graduate students by:
 - i. Formally voicing the interests and concerns of the graduate students in the Department of Entomology,

- ii. Promoting the professional development and educational enhancement of entomology graduate students through formal and informal seminars, meetings, discussions, and dissemination of literature,
- iii. Serving as a peer group source of information for the incoming and currently enrolled graduate students with respect to academic and non-academic requirement
- iv. Providing social events for graduate students, their families, and friends for interaction, relaxation, and fun

University of Delaware

Department of Entomology and Wildlife Ecology – *Seminar Coordinator* 2015

- Served as a liaison between department chair and guest scientists; kept time for speakers; organized schedules

Widener University

Widener Dance Company – *President, Vice President, Treasurer* 2009-2013

- Collaborated with adviser and university staff
- Delegated responsibilities
- Planned semi-annual recitals; Scheduled rehearsals; Recruited choreographers
- Planned and executed Dance-A-Thon for National Association of Anorexia Nervosa & Associated Disorders (ANAD); raised \$1,000
- Managed finances: ticket sales, costume purchasing

Committee Responsible for Enhancing Widener (CREW) – *Orientation Leader* 2010-2013

- Acted as a resource for new students; aided in acclimation to campus; informed students of campus services

Community Service

Food at First, Ames, IA – *Meal Preparation & Service Volunteer* 2020-present

- Food at First is a non-profit organization dedicated to providing meals to anyone who is hungry, no questions asked. FAF serves a hot meal every day of the year.
 - 107 volunteer hours as of January 2022

The Science Center of Des Moines, Des Moines, IA – *Special Event Volunteer* 2020-present

- Assisted in organization of day-of programming
- Welcomed guests, informed girls of workshop opportunities
 - i. Downtown Earth Day Tour
 - ii. Girls in Science Festival

Reiman Gardens, Ames, IA – *Butterfly Wing Docent* 2018-2019

- Assisted visitors with interpretation of the exhibits
- Trained in the Containment Facility Standard Operating Procedures and USDA Containment Guidelines
- Responsible for monitoring visitor activities and preventing the accidental or deliberate removal of butterflies, moths, or plant material from the display area

PROFESSIONAL PRESENTATIONS (complete list)

Invited Oral Presentation

2022 **Fisher, KE.** Monarch butterfly conservation needs. Big Bluestem Audubon Society. September 15, 2022. Ames, IA.

- Fisher, KE.** Implications of movement ecology in conservation planning for monarch butterflies. United States Environmental Protection Agency (US EPA) Office of Pesticide Programs (OPP) Plant Technical Team (PTT) Research Briefing. July 21, 2022. Virtual.
- Fisher, KE & RL Hellmich.** Challenges and opportunities for promoting biodiversity in agroecosystems. International Congress of Entomology. Jul 17-22. Helsinki, Finland. Virtual Presentation.
- Fisher, KE.** Monarch butterfly life cycle and conservation needs. Water Rocks! Teacher Summit. June 17, 2022. Ames, IA.
- Fisher, KE, SP Bradbury, AD Wanamaker, & BS Coates.** Monarch butterflies migrate to avoid the midwestern winter: Quantifying individual-level migration with stable isotope and genetic analyses. NCB Entomological Society of America. Mar 20, 2022. Minneapolis, MN.
- 2021 **Fisher, KE & SP Bradbury.** Estimating Perceptual Range of Female Monarch Butterflies (*Danaus plexippus*) to Potted Vegetative Common Milkweed (*Asclepias syriaca*) and Blooming Nectar Resources. American Chemical Society 2021 Virtual Meeting & Expo. Agrochemicals Division. Aug 22-26, 2021. Virtual Meeting.
- Fisher, KE.** Monarch butterfly movement ecology in the Midwest, US. Iowa Conservation Education Coalition. July 26-29, 2021. Luther College, Decorah, IA.
- Fisher, KE.** Monarch butterfly conservation in the North Central region. NCB Entomological Society of America. Jun 22, 2021. Virtual Presentation.
- 2020 **Fisher, KE.** Investigating monarch butterfly (*Danaus plexippus*) movement ecology to inform conservation strategies. Widener University Biology Department Seminar Series. Nov 30, 2020. Virtual Presentation.
- Fisher, KE.** Investigating monarch butterfly (*Danaus plexippus*) movement ecology to inform conservation strategies. American Entomological Society. Oct 28, 2020. Virtual Presentation.
- Fisher, KE & SP Bradbury.** Monarch butterfly (*Danaus plexippus*) movement ecology and perceptual range facilitates effective habitat restoration. American Chemical Society 2020 Virtual Meeting & Expo. Agrochemicals Division. Aug 17, 2020. Virtual Meeting.
- Fisher, KE & SP Bradbury.** Monarch Butterfly Population Decline: How understanding movement ecology can aid in population recovery. Iowa Pheasants Forever & Quail Forever Convention. Jan 24 – 25, 2020. Des Moines, IA.
- 2019 **Fisher, KE, J Adelman, P Dixon, & SP Bradbury.** Monarch butterfly movement ecology: Adapting automated radio telemetry to track monarch butterflies. Annual Meeting of the North Central Branch of the Entomological Society of America. Mar 17 – 20, 2019. Cincinnati, OH.
- Fisher, KE, J Adelman, P Dixon, & SP Bradbury.** Tracking monarch butterflies with radio telemetry: Insight for conservation planning. Annual Meeting of the Society of Rangeland Management. February 10 – 14, 2019, Minneapolis, MN.
- 2018 **Fisher, KE & SP Bradbury.** Iowa monarch conservation and movement ecology. Annual Iowa Turfgrass Conference & Trade Show. January 23 – 25, 2018, Altoona, IA.

Oral Presentations

- 2022 Han, G, P Dixon, KE Fisher, SP Bradbury. Locating and tracking large insects using radio telemetry. International Statistical Ecology Conference. June 27 – July 1, 2022. Breakwater Lodge, Cape Town, South Africa. Virtual Presentation.
- 2020 **Fisher, KE & SP Bradbury.** Influence of habitat configuration on breeding-season female monarch butterfly (*Danaus plexippus*) movement and space use in north-central USA agroecosystem landscapes. Annual Meeting of the Entomological Society of America Oct 31-Nov 3, 2021. Virtual Presentation.
- Fisher, KE.** Investigating monarch butterfly (*Danaus plexippus*) movement ecology to inform conservation strategies. Iowa State University Department of Entomology Seminar Series. Nov 9, 2020. Virtual Presentation.
- Fisher, KE & SP Bradbury.** Implementing radio telemetry to track monarch butterflies produces robust datasets to estimate flight patterns, habitat utilization, and perceptual range. Annual Meeting of the Entomological Society of America. Nov 11– 25, 2020, Virtual Meeting.
- Fisher, KE** Investigating monarch butterfly (*Danaus plexippus*) movement ecology to inform conservation

- strategies. Iowa State University Entomology Department Seminar Series, Ph.D. Exit Seminar. Nov 9, 2020. Virtual Presentation.
- 2019 **Fisher, KE**, P Dixon, J Adelman & SP Bradbury. Landscape scale movement: Adapting radio telemetry technology to track monarch butterflies. Annual Meeting of the Wildlife Society. Sep 29 – Oct 3, 2019. Reno, NV.
- Fisher, KE** & SP Bradbury. Estimates of common milkweed (*Asclepias syriaca*) utilization by monarch (*Danaus plexippus*) caterpillars. Iowa State University Graduate and Professional Student Research Conference. Apr 10, 2019. Ames, IA.
- Fisher, KE** & SP Bradbury. Estimates of common milkweed (*Asclepias syriaca*) utilization by monarch (*Danaus plexippus*) caterpillars. Annual Meeting of the North Central Branch of the Entomological Society of America. Mar 17 – 20, 2019. Cincinnati, OH. (3rd place award).
- 2018 **Fisher, KE**. Monarch butterfly movement ecology. Final Round of the Iowa State Three Minute Thesis (3MT®) Competition, Nov 5, 2018, Ames, IA.
- Fisher, KE**. Monarch butterfly movement ecology. Preliminary Round of the Iowa State Three Minute Thesis (3MT®) Competition, Oct 23, 2018, Ames, IA.
- Fisher, KE** & SP Bradbury. Where'd that caterpillar go? Frequency of larval movement and estimates of milkweed utilization by monarch caterpillars. The Annual Meeting of the Ecological Society of America, Aug 4 – 10, 2018, New Orleans, LA.
- Balder, T & **KE Fisher**. Mighty monarchs: Utilizing GIS for conservation questions. Iowa Technology and Geospatial Annual Conference. Jun 12 – 15, 2018, Des Moines, IA.
- Fisher, KE** & SP Bradbury. Where'd that caterpillar go? Frequency of larval movement and estimates of milkweed utilization by monarch caterpillars. Annual Meeting of the North Central Branch of the Entomological Society of America. Mar 18 – 21, 2018, Madison, WI. (3rd place award).
- 2017 **Fisher, KE**, SP Bradbury, & J Adleman. Estimating perceptual range of the monarch butterfly (*Danaus plexippus*) with an automated radio telemetry system. Annual Meeting of the Entomological Society of America. Nov 5 – 8, 2017, Denver, CO.
- Pocius, V, T Blader, & **KE Fisher**. ISU monarch workgroup projects: Progress and prospects. IA State Department of Entomology Seminar Series. Feb 6, 2017, Ames, IA.
- Fisher, KE**. Growth and development differences of European corn borer, *Ostrinia nubilalis* (Hübner), on a range of host plants. IA State Department of Entomology Brown Bag Lunch Series. Jan 26, 2017, Ames, IA.
- 2015 **Fisher, KE** & CE Mason. Growth and development differences of European corn borer, *Ostrinia nubilalis* (Hübner), on a range of host plants. Graduate Student Research Presentation Day. Mar 2015, University of Delaware, Newark, DE.
- Fisher, KE** & CE Mason. Picky caterpillars: Feeding preference of the European corn borer, *O. nubilalis* (Hübner), over a range of host plants. Annual Meeting of the Entomological Society of America. Nov 15 – 18, 2015, Minneapolis, MN.
- Fisher, KE** & CE Mason. Growth and survivorship differences of European corn borer, *Ostrinia nubilalis* (Hübner), on a range of host plants. Centennial Celebration of the Annual Meeting of the Ecological Society of America. Aug 9 – 14, 2015, Baltimore, MD.
- Fisher, KE** & CE Mason. Growth and development differences of European corn borer, *Ostrinia nubilalis* (Hübner), on a range of host plants. Annual Meeting of the Eastern Branch of the Entomological Society of America. Mar 14 – 17, 2015, Rehoboth, DE.
- 2014 **Fisher, KE** & CE Mason. Neonate host choice behavior of European corn borer, *Ostrinia nubilalis* (Hübner), on a range of host plants. Proposal Presentation. Mar 2014 University of Delaware, Newark, DE.
- 2013 **Fisher, KE** & KR Goodrich. Host plant preference of the tulip tree beauty moth (*Epimecis hortaria*). College of Arts and Sciences Summer Research Symposium. Sep 2013, Widener University, Chester, PA.
- Fisher, KE** & KR Goodrich. Host plant preference of the tulip tree beauty moth (*Epimecis hortaria*). Student Projects Day. Apr 2013, Widener University, Chester, PA.
- 2012 Colgan, MJ, KE Fisher, CA Moir, LA Ortiz, KR Goodrich, & JL Krumm. Hungry, hungry caterpillars: Food preference in the tulip tree beauty moth. Lehigh Valley Ecology and Evolution Symposium. Apr 2012, DeSales University, Center Valley, PA.

- Moir, CA, KE Fisher, MJ Colgan, LA Ortiz, KR Goodrich, & JL Krumm. You are what you eat: Larval success of *Epimecis hortaria* due to host plant diet. Annual Lehigh Valley Ecology and Evolution Symposium. Apr 2012, DeSales University, Center Valley, PA.
- Moir, CA, **KE Fisher**, JL Krumm, & KR Goodrich. Host plant diet in the tulip tree beauty moth. Student Projects Day. Apr 2012, Widener University, Chester, PA.
- Colgan, MJ, **KE Fisher**, L Ortiz, KR Goodrich, & JL Krumm. Host plant preference in *Epimecis hortaria*. Honors Week Student Presentations. Mar 2012, Widener University, Chester, PA.
- 2011 Hy, KL, A Jones, KE Fisher, CA Moir, KR Goodrich & JL Krumm. Impact of host plant species on larval success of *Epimecis hortaria*. Honors Week Student Presentations. Mar 2011, Widener University, Chester, PA

Poster Presentations

- 2020 **Fisher, KE**, BS Coates, & SP Bradbury. Prediction of mitochondrial genome-wide variation using mitochondrion enrichment and next-generation sequencing methods. International Branch of the Entomological Society of America. Apr 27-29, 2020, virtual meeting.
- 2017 **Fisher, KE**, J Adelman, & SP Bradbury. Testing methods for tracking monarch butterfly movement with radio telemetry. Annual Meeting of the Ecological Society of America. Aug 6 – 11, 2017, Portland, OR.
- 2016 **Fisher, KE**, BS Coates, & SP Bradbury. Identification of monarch mitochondrial haploypes based of direct sequencing. Annual Meeting of the Ecological Society of America. Aug 7 – 12, 2016, Ft. Lauderdale, FL.
- Fisher, KE**, B.S. Coates, & S.P. Bradbury. Identification of monarch mitochondrial haploypes based of direct sequencing. The Annual Meeting of the North Central Branch of the Entomological Society of America. Jun 5 – 8, 2016, Cleveland, OH.
- 2014 **Fisher, KE** & CE Mason. Feeding behavior of the European corn borer, *Ostrinia nubilalis* (Hüber), on a range of host plants. Annual Meeting of the Entomological Society of America. Nov 16 – 19, 2014, Portland, OR.
- 2013 **Fisher, KE**, J Koble, & BW Grant. Invertebrate Biodiversity in an Urban Setting. Student Projects Day. Apr 2013, Widener University, Chester, PA.
- 2012 **Fisher, KE** & KR Goodrich. Host plant preference of the tulip tree beauty moth (*Epimecis hortaria*). College of Arts and Sciences Summer Research Symposium. Sep 2012, Widener University, Chester, PA.
- 2011 Moir, CA, **KE Fisher**, MJ Colgan, L Ortiz, KL Hy, AL Jones, KR Goodrich & JL Krumm. Host plant choice and larval success in *Epimecis hortaria*. Annual Meeting of the Ecological Society of America. Aug 7 – 12, 2011, Austin, TX.
- Fisher, KE**, L Ortiz, CA Moir, MJ Colgan, K Hy, JL Krumm & KR Goodrich. Impact of host plant species on larval success in *Epimecis hortaria*. College of Arts and Sciences Summer Research Symposium. Sep 2011, Widener University, Chester, PA.
- Jones, A, **KE Fisher**, CA Moir, KL Hy, JL Krumm & KR Goodrich. Impact of host plant species on larval success of *Epimecis hortaria*. Student Projects Day. Apr 2011, Widener University, Chester, PA.
- Moir, C, MJ Colgan, L Ortiz, KE Fisher, JL Krumm & KR Goodrich. Impact of host plant species on food preference in *Epimecis hortaria*. College of Arts and Sciences Summer Research Symposium. Apr 2011, Widener University, Chester, PA.
- Jones, AL, **KE Fisher**, CA Moir, KL Hy, KR Goodrich & JL Krumm. Impact of host plant species on larval success of *Epimecis hortaria*. Mid-Atlantic Chapter Ecological Society of America and New Jersey Academy of Sciences Joint Meeting. Apr 2011, Montclair State University, Montclair, NJ.
- 2010 Hy, KL, KE Fisher, CA Moir, A Jones, K Goodrich & JL Krumm. Impact of host plant species on larval success in *Epimecis hortaria*. Widener University College of Arts and Sciences Summer Research Symposium. Sep 2010, Chester, PA (3rd place award).
- Jones, A, CA Moir, **KE Fisher**, KR Goodrich, & JL Krumm. Do floral spiders limit pollination rate in pawpaw? Widener University College of Arts and Sciences Summer Research Symposium. Sep 2010, Chester, PA.

Presentations by Mentored Undergraduate Students

- 2020 Snyder, BR, KE Fisher, SP Bradbury. Observations of monarch butterfly interactions with plant resources in Iowa (poster). Virtual ISU Summer Undergraduate Research Symposium. Aug 3, 2020. Virtual meeting.
- Jans, K, M Ubbelohde, KE Fisher, SP Bradbury. The effects of monarch larval interactions on survival and fitness (poster). Monarch Working Group Biweekly Meeting. Apr 2020. Virtual meeting.
- Rouse, T, KE Fisher, SP Bradbury. Exploring motivation for monarch caterpillar movement. Monarch Working Group Biweekly Meeting. Apr 2020. Virtual meeting.
- Snyder, BR, KE Fisher, SP Bradbury. Observations of monarch butterfly interactions with plant resources in Iowa (poster). Iowa Chapter of The Wildlife Society Annual Winter Meeting. Feb 11-12, 2020. Ames, IA.
- Anderson, KE, SN Shimota, KE Fisher, SP Bradbury. Feeding behavior of monarch larvae: Is there a preference for new vegetation? (poster). Iowa Chapter of The Wildlife Society Annual Winter Meeting. Feb 11-12, 2020. Ames, IA.
- 2019 Anderson, KE, SN Shimota, KE Fisher, SP Bradbury. Feeding behavior of monarch larvae: Is there a preference for new vegetation? (poster). Iowa State University Department of Natural Resource Ecology and Management Student Poster Symposium. Dec 6, 2019. Ames, IA.
- Acevedo C, KE Fisher, SP Bradbury. Monarch larval movement on common milkweed (poster). First Americans Land-Grant Consortium. Oct 25 – 28, 2019. Denver, CO.
- Arbuckle, H, A Jenkins, KE Fisher & SP Bradbury. How sharing milkweed with other monarchs affects monarch larval behavior and weight gain (poster). Iowa State University Honors Poster Presentation. May 1, 2019. Ames, IA.
- Wernsing, K, C White, E Windschitl, KE Fisher & SP Bradbury. An experimental design to estimate the number of milkweed plants needed to support larval monarch butterfly development (poster). Iowa State University Symposium on Undergraduate Research & Creative Expression. Apr 17, 2019. Ames, IA.
- Wernsing, K, C White, E Windschitl, KE Fisher & SP Bradbury. An experimental design to estimate the number of milkweed plants needed to support larval monarch butterfly development (poster). Annual Meeting of the National Conference on Undergraduate Research. Apr 11 – 13, 2019. Kennesaw, GA.
- Weingarten, CR, KE Fisher, EW Hodgson, SP Bradbury. Evaluating monarch flight with a transmitter prototype (poster). Annual Meeting of the North Central Branch of the Entomological Society of America. Mar 17 – 20, 2019, Cincinnati, OH. (3rd place award).
- 2018 Acevedo C, KE Fisher, SP Bradbury. Monarch larval movement on common milkweed (poster). Iowa State University Summer Undergraduate Research Symposium. Aug 2, 2018. Ames, IA.
- Acevedo C, KE Fisher, SP Bradbury. Monarch larval movement on common milkweed (poster). Iowa State University Chapter of LSAMP-IINSPIRE's Summer Research Symposium. Jul 25, 2018. Ames, IA.
- Wernsing, K, C White, E Windschitl, KE Fisher, SP Bradbury. Monarch instar biomass consumption and its correlation to stems present (poster). Iowa State University Honors Poster Presentation. Apr 25, 2018. Ames, IA.
- 2017 Hilby, S, KE Fisher, SP Bradbury. Flying time of monarch butterflies equipped with radio transmitters (poster). Iowa State University George Washington Carver Summer Research Internship Program Symposium. Aug 4, 2017. Ames, IA.
- Hilby, S, KE Fisher, SP Bradbury. Flying time of monarch butterflies equipped with radio transmitters (oral presentation). Iowa State University George Washington Carver Summer Research Internship Program Symposium. Aug 4, 2017. Ames, IA.

REFERENCES (all may be contacted)

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